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ferments of various fungi. The results constitute a number of detached facts not readily summed up in a review; however, some of the main points may be noted. The press-extract of some of the fungi was found to be incapable of splitting any of the sugars used, while the residue was found capable of active fermentation, showing that the ferments in these cases are incapable of being separated from the rest of the cell by the Buchner process. In the case of *Aspergillus Wentii*, both the extract and the residue fermented cane sugar, milk sugar, maltose, cellobiose, and raffinose. It is of special interest to note that some of the fungi were able to utilize as food disaccharides, which neither the expressed juice nor the residue were able to ferment. These sugars were probably assimilated directly. The behavior of raffinose varied with different fungi. With *Aspergillus Wentii* this sugar was split into *d*-glucose, *d*-fructose, and *d*-galactose. In five other cases it was split into *d*-fructose and melibiose, and in three cases into *d*-galactose and cane sugar.—H. HASSELBRING.

The ring and cell wall of Oedogonium.—According to VAN WISSELINGH,³⁰ the cell wall of Oedogonium consists of two distinct layers; the outer containing little cellulose, but a large proportion of a characteristic membrane-forming material whose reactions are described, but whose chemical composition was not determined; while the inner wall is rich in cellulose and has a lamellate structure. The outer layer is lacking in the basal cell. The ring is a portion of the cell wall which arises by the intussusception of various membrane-forming materials, among which cellulose is prominent, especially in the centripetal portion. The rupture of the old wall and the stretching of the ring to form a new wall is about as usually described. The inner cellulose layer of the wall arises by apposition. The chemical tests and the observations are satisfactory so far as they go, but the subject is a much described and much discussed one, and it would seem that an investigator acquainted with technic, as VAN WISSELINGH is, could have advanced our knowledge much farther by adding a study of carefully stained sections.—CHARLES J. CHAMBERLAIN.

Anatomy of Saxegothaea.—TISON³¹ has investigated the vascular anatomy of *Saxegothaea conspicua*, especially that of the ovulate strobilus. This genus has received much attention recently (NORÉN, STILES, THOMSON), and investigators have been impressed by its suggestion of araucarian affinities. TISON concludes, from the behavior and distribution of the two systems of bundles found in the megasporophyll (one serving the sporophyll and the other the ovule), that Saxegothaea is more nearly related to the araucarians than to the podocarps, but that through Microcachrys it is so definitely connected with the latter that the araucarians, Saxegothaea, and the podocarps should constitute a single group,

³⁰ WISSELINGH, C. VAN, Ueber den Ring und die Zellwand bei Oedogonium. Beih. Bot. Centralbl. 23: 157-190. pls. 13-16. 1908.

³¹ TISON, A., Sur le Saxegothaea Lndl. Mém. Soc. Linn. Normandie 23: 139-160. pls. 9, 10. 1909.

with the three subdivisions indicated. This conclusion depends upon the view that the structure of the ovulate cone, especially its vascular structure, is the paramount feature in determining relationship. An interesting incidental suggestion (following BERTRAND) is that the aril of *Saxegothaea* is the equivalent of the ligule of *Araucaria* and the ovuliferous scale of other conifers.—J. M. C.

A primitive lichen.—*Botrydina vulgaris*, regarded in general as a problematical green alga, has now been investigated by Miss ACTON.³² It occurs as dark green, globular structures, which in the material examined were covering the shoots of a moss and a liverwort. Each one of these structures proved to consist of a central group of algal cells imbedded in mucilage, which in turn was traversed by investing fungal hyphae that formed also a colorless envelope of considerable thickness. The cultures showed that both the alga and the fungus are "able to develop quite well apart, and multiplication of *Botrydina* is probably due to this." Since this structure consists of an alga and a fungus growing symbiotically, the conclusion is that it should be regarded as a lichen, and that it is "possibly one of the most primitive of existing lichens." The alga and the fungus were both determined, and the habitat is said to be "in damp shady situations among various bryophytes, generally on rocks, but sometimes on damp ground."—J. M. C.

Movements of *Myriophyllum* leaves.—WÄCHTER has recorded³³ some interesting phenomena regarding the young leaves of *Myriophyllum proserpinacoides*. The leaves of both the land and water form of this plant have already been known to execute so-called sleep movements, so long as they are capable of growth; and such movements would be very properly called photonastic.³⁴ In studying these movements WÄCHTER has discovered that leaves which had almost or quite ceased to respond to light would resume these curvatures if the shoot were decapitated. This seems to be a phenomenon analogous to the reactivation of growth in the nodes of grasses under a gravity stimulus, and still more like the reaction of certain conifers to decapitation, though different in details from either. It has also relations to the excitation of growth by a wound stimulus, and compensative growth such as that in *Streptocarpus* when the big cotyledon is removed or incased in plaster and the small one resumes its development.—C. R. B.

The mycorrhiza of *Cordaites*.—*Amyelon radicans* is a root of the Coal Measures, which has been shown to belong to *Cordaites*. It bears such remarkable and irregularly arranged bunches of lateral roots, that OSBORN³⁵ has examined

³² ACTON, ELIZABETH, *Botrydina vulgaris* Brebisson, a primitive lichen. *Annals of Botany* 23:579-585. *pl.* 44. 1909.

³³ WÄCHTER, W., Beobachtungen über die Bewegungen der Blätter von *Myriophyllum proserpinacoides*. *Jahrb. Wiss. Bot.* 46:418-442. *figs.* 2. 1909.

³⁴ Cf. *BOT. GAZETTE* 48:313. 1909.

³⁵ OSBORN, T. G. B., The lateral roots of *Amyelon radicans* Will., and their mycorrhiza. *Annals of Botany* 23:603-611. *pls.* 46, 47. 1909.